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# Impact of soil-vegetation representation on episodic and regional climate simulation

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For long-term regional climate simulations with high spatial model resolution we use the climate version of Local Model (CLM) of the German Weather Service (DWD). For such simulations land-atmosphere feedbacks are very important. The incorrect modelling of soil moisture content, soil temperature and surface properties can cause a drift in the long-term results and a false partitioning of the water and energy budget. Also local atmospheric processes like convection and wind circulations are very sensitive to soil-vegetation representation.

In the standard CLM a multilayer soil model without explicit vegetation and with simple hydraulic parameterization is used. It is well known that the use of more detailed soil-vegetation-atmosphere transfer models in atmospheric models lead to an improvement of the model results (Seuffert et. al. 2002). Hence we have replaced this soil model by the soil-vegetation model VEG3D (Braun and Schädler, 2005). Unlike the DWD soil model the VEG3D has a vegetation layer (“big leaf”) and processes land use data explicitly. VEG3D offers a choice of different soil hydraulic parameterizations including the van Genuchten (1980) parameterization.

Results of simulations are presented for southwest Germany for daily and seasonal episodes and compared to measurements. The presentation shows that for days with convection the land atmosphere coupling and the energy budget is better simulated with the new soil model. Also case studies of snow episodes are presented. Simulations of the whole year 2001 are compared with the old version and with measurements to investigate the behaviour of the model configuration over a longer time scale.